

France, simultaneously with their development by Vogelsang, von Lasaulx, and Rosenbusch in Germany. A dual nomenclature, indeed, grew up, for certain structures in igneous rocks, of which traces are still clear when we compare works produced on opposite banks of that great factor in literature, the Rhine.

Lévy, in his desire to understand, and not merely to describe, set himself to construct igneous rocks by fusion in the laboratory, as Ste.-Claire Deville and others had constructed rock-forming minerals. In the domain of lavas the results, produced in collaboration with A. Lacroix, were especially successful, and surpassed the expectations of petrologists, who had previously been content with glassy slags. Carrying the study of the optical properties of minerals in thin sections to a high degree of refinement, Lévy and Lacroix issued their book on "Les Minéraux des Roches" in 1888, and the details there given have formed the basis for a long series of researches by their followers in many lands.

The separation of the members of the felspar family, those halting-points in the continuous series indicated, on chemical grounds, by Tschermak, received special attention in Lévy's memoir on the "Détermination des Feldspaths" in 1894. But those who have watched the development of the French Geological Survey will also recognise how much is due to Lévy as an organiser in the field. The gneisses of the Morvan occupied his attention twenty-four years ago, and in 1887, in a modest paper entitled "Sur l'origine des Terrains cristallins primitifs," published by the Société géologique de France, he set forth his belief that dynamic metamorphism had been overrated as a cause of the crystallisation of minerals in schists. His official memoir on the "Granite de Flamanville" (1893) shows how far he was prepared to go in urging the potency of contact metamorphism and mutual absorption in the production of types of crystalline rock; and his views, associated as they were with the parallel work of Barrois, laid the foundation for many later observations, such as those of Lacroix, Sederholm, and Daly.

Lévy's official work extended to an investigation of the water supply of his country, a research of immense public importance, which is still in progress. His secure position as one of the foremost of scientific men earned him his election as a member of the Institute of France. For those who wish to have before them, and for future generations of their students, the record of the firm and noble features of Lévy as he lived, it may be well to mention the fine photogravure portrait now included in the series by Eckstein, of Berlin.

#### DR. F. AMEGHINO.

A CIRCULAR letter recently received at the British Museum (Natural History) from the president of the Sociedad Científica Argentina, Buenos Aires, announces the death of Dr. Florentino Ameghino, the well-known palæontologist, as having taken place at La Plata, on August 6. We believe that the cause of death was neglect of a limb that had been wounded in an accident, the deceased refusing to call in medical assistance. For many years Dr. Ameghino kept a small stationer's shop in La Plata, and it was there that much of his palæontological work was carried on. When and how his attention was first directed to this subject we have no information, but it must evidently have been during the 'seventies, as he published a paper entitled "L'homme préhistorique dans la Plata" in the second volume of the *Revue d'Anthropologie*, 1870. This was followed by a number of

papers in various local journals on the Tertiary mammals of Patagonia, the materials of which were collected by his brother, Carlos Ameghino, who for many years afterwards continued to make collecting journeys to that country; but whether on his own account or at the instance of others we are unaware.

Figures and fuller descriptions of the, frequently fragmentary, specimens upon which scores of species and genera were founded in these preliminary papers were given in a quarto two-volume work, published at Buenos Aires in 1889, under the title of "Contribucion al conocimiento de los Mamíferos fosiles de la República Argentina." This was followed by a perfect stream of memoirs and papers on the fossil mammals and birds of Patagonia and other parts of the Argentine Republic, in all of which the author insisted that the Santa Cruz beds are Lower Eocene, and some of the other mammaliferous horizons of Patagonia Cretaceous, whereas most palæontologists consider them to be not older than Oligocene.

In 1895 Dr. Ameghino published in Buenos Aires an important memoir entitled "Sur les Oiseaux fossiles de Patagonie," in which appeared a full account of the gigantic seriema-like *Phororhachis*. The discovery and description of this wonderful bird were alone quite sufficient to have made Ameghino's name celebrated in palæontological annals; another great discovery being that of the development of a monodactyle type of foot in an animal far below the grade of the horse. That Ameghino, out of the redundancy of his material, should have been profuse in naming species and genera, is, although a matter for regret, scarcely to be wondered at, and must not be allowed to obscure our view of the value of his work in bringing to notice the marvels of the ancient fauna of Patagonia.

On the death of Dr. Carlos Berg, Dr. Ameghino was appointed director of the Museum at Buenos Aires, a post he held until his death.

#### NOTES.

REUTER'S agency states that the British Government is sending out a further commission to Central Africa in connection with sleeping sickness. This will be in charge of Colonel Sir David Bruce, who will be accompanied by Lady Bruce, and assisted by Captain Hamerton, R.A.M.C., Prof. Newstead, of the Liverpool School of Tropical Medicine, Major Harvey, R.A.M.C., Staff-Sergeant Gibbons, and Mr. James Wilson. The work of the commission will on this occasion be confined to Nyasaland, where more than forty cases of sleeping sickness have occurred since 1909. The commission, which is also under the auspices of the Royal Society, is expected to be absent from England for three years. Sir David and Lady Bruce will leave Marseilles on November 10, and will proceed up the Zambezi and the Shire Rivers to Blantyre and Zomba, the capital of Nyasaland. One of the principal objects of the commission is to endeavour to ascertain whether the existence of the fly supposed to be responsible for sleeping sickness in Nyasaland depends upon the presence of big game.

ALL artists and chemists will learn with regret that Sir Arthur Church has decided to retire from his position as professor of chemistry to the Royal Academy, where he has for so many years not only acted as guide to the young art student through the intricate subject of chemistry as applied to the painting of pictures, but has also performed invaluable services both in advising and assisting artists in their work, and on many occasions helping the Government in the preservation of works of art. His careful

investigations and restorations of the frescoes in the Houses of Parliament, and his invaluable work in the preservation of ancient stone buildings, such as Westminster Abbey, are well known to all who are acquainted with these subjects. While on one hand Sir Arthur Church was for many years professor of chemistry at the Royal Agricultural College at Cirencester, and has done invaluable work in connection with the application of chemistry to agriculture, on the other hand he may be said to be one of the few living chemists who have applied their scientific knowledge to the problems connected with the applied arts; and he has done this not only in the department of chemistry, but also in the scientific theory of colour as applied to decoration. He is also known as an authority on precious stones, porcelain, and earthenware, and has shown all his life that interesting combination of the scientific and artistic temperament which is rarely found. It is to be hoped that his retirement from the professorship will mean merely that he will have greater leisure to continue his many researches on the application of chemistry to painting, researches upon which the permanency of some of our greatest works of art must ultimately depend.

REUTER reports that a slight earthquake shock was felt at Catania on October 15. The shock was more severe at Giarre, Macchia, Guardia, Rondinella, and Santa Venerina.

THE South African Branch of the Royal Sanitary Institute is arranging to hold a congress in Cape Town on November 9-11. This is the first sanitary congress to be held in British South Africa.

THE death is announced, on October 10, of Dr. W. R. Huggard, the British Consul at Davos, Switzerland. Dr. Huggard was an authority on mental diseases and tuberculosis. He was not a prolific writer, but was known as the author of a "Handbook of Climatic Treatment, including Balneology," and a few papers in medical periodicals. Dr. Huggard had been a resident at Davos for twenty-five years.

THE death is announced of the Rev. Mariam Balcells, S.J., professor of mathematics at Boston College, Mass. A native of Tarragona, he was for a time connected with the Spanish Geological Survey. He became director of the Ebro Observatory of Cosmical Physics, which he had himself built during his earlier career as an engineer. He introduced into Spain the study of the solar chromosphere by means of the spectroheliograph, and in collaboration with Father Cirera, now the director of the observatory, made various investigations of the relation between solar activity and terrestrial magnetism.

FROM the Abor expedition, which is about to start, we have a good prospect of learning more about this little-known region. Besides the surveying work which is always carried out on such mountain expeditions, the Government of India has arranged for as much scientific investigation to be carried out as the circumstances will admit. According to *The Morning Post*, Mr. J. H. Burkill will be the botanist, and Mr. S. Kamps and Mr. R. Hodgirt will take charge of zoology and anthropology respectively. A geologist will accompany the expedition, but the definite appointment has not been announced. Captain Trenchard and Lieut. Oakes are in charge of the survey operations. An interesting experiment is being made with various forms of rations, and especially with compressed tea, which has been made up into small cases of 45 lb. each for handy transport.

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At the present time Mr. Chas. Urban, who has done so much to correct our geographical impressions, is exhibiting at the Scala Theatre a "kinemacolor" representation of the recent eruption of Etna. It is not an exciting show, though possibly the photographer got uncomfortably hot, for the most interesting feature of the film is the portion depicting the slowly advancing front of a lava stream. This is well worth seeing by any geologist who has not actually witnessed this type of flow. There is a peculiar fascination in watching the deliberate fragmentation of the cooling lava-crust, with the continuous detachment of solidified blocks, each with its attendant puff of white steam. Sitting in the comfortable seats of the Scala, the visitor would like more of this portion; but no doubt there were difficulties.

THE eighteenth International Congress of Americanists is to be held in London from May 27 to June 1, 1912. This will be the first time the congress will have visited Great Britain. The main subjects to be considered at next year's meeting are:—(a) the aboriginal races of America, their origin, distribution, history, physical characteristics, languages, customs, and religions; (b) the monuments and archæology of America; and (c) the history of the discovery and occupation of the New World. H.R.H. the Duke of Connaught is the patron and Sir Clements Markham president. The organising committee includes Sir Richard Martin, Sir T. Holland, Dr. C. H. Read, Profs. Gowland and J. L. Myres, Mr. H. Balfour, and others, with Mr. Alfred Maudslay as chairman. Titles of papers to be presented at the meeting of the congress should be sent immediately to the secretary, c/o the Royal Anthropological Institute, 50 Great Russell Street, London, W.C.; and it is further requested that synopses of the papers may be sent in by March 31, 1912. Communications may be oral or written, and the languages admitted are English, German, French, Italian, and Spanish.

MR. E. A. GAIT, Census Commissioner for India, has collected into a single volume the detailed instructions issued to the provincial superintendents describing the subjects on which it is desired that information should be collected and embodied in their reports now in course of preparation. Of particular interest are the inquiries into the internal working of the caste system and the extent to which the rulers of independent States exercise their traditional prerogative of interfering in such matters; the investigation whether the existence of the Mendelian law can be traced in the crosses between different races; birth and marriage customs; and numerous other subjects which have been discussed only in a summary way during the last and previous enumerations of the people. If the provincial superintendents, in addition to the task of compiling and explaining the statistics, can find time and opportunity for undertaking this investigation, the forthcoming reports of the census of 1911 are sure to furnish materials of much interest to students of anthropology and sociology.

THE committee appointed to investigate ancient earthworks and fortified enclosures has prepared a report for presentation to the Congress of Archæological Societies. The committee reports steady progress in the investigation of these monuments, in particular in Hampshire, where Dr. J. P. Williams is engaged in cataloguing the barrows of that county after the completion of his list of earthworks. Measures of preservation have been adopted in the case of the Stokeleigh Camp in Somerset, the Scambridge Dykes in Yorkshire, and at Skipsea in the

same county. The committee regrets to announce grievous destruction at the earthworks of Willington in Bedfordshire, Penmaenmawr in Carnarvonshire, Uley Bury in Gloucestershire, Stainton in Westmorland, and of the ditch round the top of Windmill Hill at Avebury, in Wilts. Excavations have been carried out on several sites, the most important being those at Avebury under the control of Mr. St. George Gray, and some preliminary investigations of Stokeleigh Camp, in Somersetshire, by Prof. C. Lloyd Morgan and Mr. A. E. Hudd, but nothing was found to throw further light on the origin and construction of the camp. At Old Sarum the work of the Society of Antiquaries was practically confined to the uncovering of masonry structures.

In 1878 ("Cat. Chiroptera Brit. Mus.") Dr. Dobson gave the name *Kerivoula brunnea* to a bat collected by Sir Andrew Smith years previously, leaving it open whether the habitat was South Africa or Madras. Until a short time ago that specimen remained the only known representative of the species; but it is announced in the Annals of the Transvaal Museum for April that a second example has been obtained in Portuguese East Africa, thus fixing the habitat.

In an article on a new species of Hipparion (*H. proboscideum*) from the Upper Tertiary of Samos, published in *Verh. Deutsch. Zool. Ges.*, 1910-11, p. 192, Prof. Studer expresses the opinion that the preorbital depression or pit found in the skull of many members of the horse group is not for the reception of a lacrymal gland, but is for the purpose of muscular attachment, and attains its maximum development in species like *Onohippidium* and *Hipparion proboscideum*, which were probably furnished with a proboscis. The position of the pit, it is stated, differs somewhat from that of a true larmier, and the inframaxillary foramen is always some distance from the pit. This accords, in some degree, with the views of Mr. R. I. Pocock, who has pointed out that in *Onohippidium* the pit is divided into two moieties, one of which may have contained a gland, and that the pit in *Hipparion* is probably also glandular. From the fact that a preorbital pit occurs in *Merychippus*, as well as in the above-mentioned genera, Dr. Studer is inclined to think that a proboscis may have been developed in most or all of the forerunners of the horse group.

A THIRD part of the publication "Illustrations of New South Wales Plants," for which Mr. J. H. Maiden is responsible, contains descriptions of seven species of *Callistemon*, the bottle-brushes, and four species of *Swainsona*; all except *Callistemon lanceolatus* are illustrated. A key to the species of *Callistemon*, prepared by Mr. E. Cheel, separates a large section having anthers with free filaments from a small section displaying coherent filaments. Certain species are cultivated, notably *C. rigidus* and *C. pinifolius*, here described. *Swainsona*, belonging to the Papilionatæ, includes some fodder plants and a few that are poisonous to stock.

A PUZZLING fossil organism, named *Traquairia* by Mr. Carruthers, forms the subject of a short article contributed by Mrs. D. H. Scott to the *Annals of Botany* (April), a separate copy of which has just reached us. The chief feature in the organism is the complicated structure of the outer envelope, with an elaborate system of anastomosing tubes connected with prominent spines. It was originally referred by Mr. Carruthers to the radiolarians, but subsequent botanical investigators have regarded it as a possible reproductive organ of a cryptogamic plant. With-

out expressing a definite opinion, the author inclines towards the original suggestion. The chief object of the paper is to identify and describe four species that differ primarily in the nature of the spines.

ARISING out of an investigation into the sources of the Ignatius beans of commerce, furnished by species of *Strychnos*, Mr. A. W. Hill has prepared a revision of East Indian and Philippine species of the genus, and it is published in *The Kew Bulletin* (No. 7). The section, characterised by long corolla tubes and large fruits containing strychnine, forms a very natural group, ranging in distribution throughout the area, although the individual species conform to the general rule of localised distribution. Types of seven new species are described. Another systematic article is provided by the list of new African plants, which includes two new genera, *Discoglypsemna* and *Sclerodactylon*. Also a new genus, *Dipentodon*, showing unique floral characters, is discussed by Mr. S. T. Dunn, who places it provisionally in the Celastraceæ.

THE United States Geological Survey has published ten bulletins (Nos. 457-464, 469, 472, 473) dealing with the results of spirit-levelling during the last ten or fifteen years in various parts of the country. A plate showing the form of bench-mark used is now included to facilitate recognition of the bronze or aluminium plate on which the altitude to the nearest foot, before the final corrections are applied in the office, is stamped.

THE Canadian Department of Mines has published a summary of the triangulation and spirit-levelling carried out in Vancouver Island, B.C., in 1909. Descriptions of the stations are given, and the azimuths, back-azimuths, and distances of points observed from each station are tabulated; but the method of observing is not stated, nor is the accuracy attained anywhere indicated. An 8-inch theodolite, with two micrometer microscopes reading to two seconds, was used. The levelling was carried out with a 14-inch Dampy level, each line being run at least twice; altitudes are tabulated to 0.001 foot, but here again there is no indication of the precision aimed at or attained.

THE mining town of Burketown is in the north-western corner of Queensland. Its ore deposits were first discovered by Mr. F. H. Hann in 1887, but mining was only begun in 1897; since then several of the ore deposits have been worked, and concentrates carted to the coast at Burketown, one hundred miles distant. The leading mining company of the district, the Queensland Silver Lead Mines, Ltd., recently arranged for an inspection of the field by one of the officers of the Queensland Geological Survey. The work was entrusted to Mr. Lionel C. Ball, whose report, illustrated by five maps, twenty-three plates, and forty plans, has now been issued by the Geological Survey of Queensland (Publication No. 232). Mr. Ball is impressed by the widespread distribution of the ores; but the quantity of high grade is small, and the success of the field will depend upon the large low-grade ore bodies. The ore deposits are mainly brecciated lodes in a series of silicified sandstones and indurated shales. The report contains not only a precise account of the chief mineral deposits, but includes some important contributions to the geology of north-western Queensland.

THE U.S. Weather Bureau has issued a special bulletin relating to the destructive hurricane which visited the South Carolina-Georgia coast on August 27-28. Synoptic weather charts are drawn for the Atlantic Ocean for August 25-28, giving the position of the hurricane; reports from vessels show that the storm was in process of forma-



tion on August 23 in about latitude  $24^{\circ}$  and longitude  $67^{\circ} 30'$ . Its course was far north of the normal path of tropical disturbances at this season of the year, and its influence was not felt at any stations in the West Indies; the first signs of its approach were felt at the land stations that suffered most, viz. Charleston and Savannah, on the morning of August 27, and warnings of its approach were fortunately sent by the Central Bureau to both those stations and to shipping at various ports, thus minimising the danger so far as possible. The centre of the hurricane reached the coast near Savannah at 8h. a.m. of August 28, passed through eastern Georgia, recurved over North Carolina to E.N.E., and passed to sea off the New Jersey coast. Immense damage was wrought, both to houses and shipping, the velocity of the wind at places exceeding 100 miles an hour (factor 3?). Prof. Moore remarks that, had wireless reports been at hand, it would have been possible to give warning of the approach of the storm several days previously; but this would not have saved the hundreds of houses unroofed, the destruction of telegraph wires, and the like.

As stated in NATURE of September 28 (p. 417), at the Turin meeting of the International Electrochemical Commission the committee on international symbols agreed provisionally to the proposals made at the Brussels meeting. These were to represent mass, length, and time by *Mm*, *Ll*, and *Tt*; electric current, electromotive force, and resistance by *I*, *E*, and *R*; quantity of electricity by *Qq*; magnetic field and induction by *H* and *B*; inductance by *L*; the last three symbols to be printed in special type not yet settled. The maximum value of any quantity to be indicated by the subscript *m*.

THE *Verhandlungen* of the German Physical Society for September 15 contains a paper by Dr. A. R. Meyer, of the University of Greifswald, on the change of the electrical resistivity of pure iron from  $0^{\circ}$  to  $1000^{\circ}$  C. The iron is in the form of a wire, and is enclosed in an evacuated glass bulb. Its resistance is measured by the fall of potential down the central portion of it, due to the passage of the heating current. Its temperature is measured thermoelectrically by means of a fine platinum-platinum-rhodium junction in contact with it, or by means of a radiation pyrometer. For each of three specimens of iron the resistance increases more rapidly with temperature as the temperature rises until  $700^{\circ}$  C. is reached. Above this temperature the rate of increase is smaller and more nearly uniform. Up to  $700^{\circ}$  C. the watts spent in the wire, the current through it, the electromotive force at its ends, and its resistance are all proportional to powers of the absolute temperature.

THE September issue of the Journal of the Chemical Society contains obituary notices of Profs. Beilstein, Erlenmeyer, Fittig, Landolt, and Menshutkin. In addition to the biographic and scientific narrative, an admirable series of portraits is given. In the case of Prof. Beilstein, the notice is signed by Prof. Otto N. Witt.

THE forty-second volume of the *Sitzungsberichte* of the Physikalisch-medizinischen Societät in Erlangen has recently come to hand. In addition to five papers by Prof. E. Wiedemann on the history of science, the volume includes chemical papers on the halogenaurates of ethylene- and propylene-diammonium, by A. Gutbier and C. J. Obermaier on the copper salts of ferro- and ferri-cyanic acid, and by L. Hovermann on the atomic weight of iridium. The values deduced for this atomic weight by four different methods from the analysis of the salt

$K_2IrCl_6$ , were 192.942, 192.881, 192.956, and 193.116, whilst the analysis of the salt  $(NH_4)_2IrCl_6$  gave the value 193.403.

The *Scientific American* of September 16 is devoted specially to industrial chemistry. It contains articles on "How Electricity is Aiding the Chemist," by Prof. W. H. Walker, of Massachusetts; on "Artificial Rubber," by Prof. Ira Remsen; on "Testing before Buying," by Dr. C. F. McKenna; on "Catalysis," by A. J. Lotka; on "The Industrial Chemist," by Prof. R. K. Duncan; and on "The Technically Trained Foreman," by Dr. Allen Rogers. The magazine is attractively produced, and contains a number of interesting and unfamiliar illustrations, but suffers from the disagreeable characteristic of American journalism whereby each article is interrupted at the conclusion of its first or second page and continued in fragments amongst the advertisements.

DEALING with the destruction of the Austin dam, Pennsylvania, *The Engineer* for October 13 states that, shortly before the actual disaster, the condition of the structure had aroused fears among the residents of the towns below, and that these, being expressed, had the effect of inducing the owners to undertake certain minor protective measures. It is questionable whether anything short of complete reconstruction could have saved the dam. Owing to the upward overturning pressures caused by leakages below the foundations, the alignment of the upper edge had last summer already become a slight arc. That this was the real cause of the disaster is the opinion of the engineer who designed the dam, and reported on the defects discovered in January, 1910. He and another engineer reported the dam to be safe, notwithstanding these defects, but made certain recommendations for the repair and reinforcement of the structure. These, however, he was not engaged to supervise, and he has no knowledge that they were ever carried out. That Austin will be rebuilt, or the lumber industry of the district survive the calamity, seem improbable. The local timber supply was rapidly nearing exhaustion, and at the best could have held out but five years longer. To these circumstances, perhaps, in some degree, may be attributed the comparatively few and ineffectual measures taken to safeguard public interests.

*Engineering* for October 13 contains an account of the demolition of the Bridlington railway bridge on the North-Eastern Railway, an operation which was carried out by the Ammonal Explosives, Ltd., of London. The bridge was composed of five arches, each arch having a span of 18 feet, with a width of  $37\frac{1}{2}$  feet. The arches were built of four courses of hard ringing bricks set in cement, forming a hard, tenacious mass of masonry requiring to be pulverised completely and instantaneously. To facilitate the operation, the surface of the bridge had been stripped, leaving simply the crowns of the arches and the buttresses to be blown down. As the bridge was separated from the station and buildings by only about 8 or 10 feet, the crowns of the arches only were blown down at the first operation. The total quantity of ammonal No. 5 explosive used was 39.5 lb., distributed in 139 holes. A feature of the operation rendering it more than usually interesting was the employment, for the first time in England, of an entirely new kind of detonating fuse, called Bickford's toluene fuse or "Cordeau" detonant. With this fuse, detonators in each cartridge are dispensed with. The fuse may be either laid alongside or simply inserted into each cartridge, and one detonator, attached to the firing end of the fuse, alone is necessary to cause the instantaneous detonation of the whole mined structure. The whole operation was conducted in a most successful manner.

MESSRS. H. F. ANGUS AND CO., of Wigmore Street, London, W., have issued their second catalogue of second-hand scientific apparatus and accessories. All the instruments listed have been tested, adjusted where necessary, and, unless otherwise stated, are capable of work of equal precision as when new. The catalogue gives particulars of microscopes and accessories, various other optical instruments, and sundry apparatus.

THE second part of vol. iv. of the Proceedings of the University of Durham Philosophical Society can now be obtained from Messrs. A. Reid and Co., Ltd., of Newcastle-upon-Tyne. It includes a selection of the papers read to the society between December 8, 1910, and May 11, 1911. These papers include a description of a new steam trap, by Mr. E. M. Eden; one by Prof. Henry Louis on the mutual development of metallurgy and engineering; and others by Dr. T. H. Havelock, on the displacement of the particles in a case of fluid motion; by Dr. J. A. Smythe, on benzyl-orthothioformate; and by Dr. A. A. Hall, on the relationship between the chemical composition and the position of some North Country clays. In addition there is a report of the Boulders Committee on the boulders and pebbles collected or determined since the last report of the committee.

ERRATUM.—In line 9 of Mr. Rollo Appleyard's letter in NATURE of October 12, for  $A=e$  read  $A=e^v$ . The expression was correctly given by Mr. Appleyard in his letter, and the  $v$  was in place in the page passed for press, but it fell out in the course of printing last week's issue.

### OUR ASTRONOMICAL COLUMN.

CHANGES ON MARS.—An observation made by M. Jarry Desloges at the Masséguet Observatory, and published in Circular No. 133 from the Kiel Centralstelle, records a change on the Martian feature Libya. Previous observations had shown this area to be of a dull greyish hue, but on October 12 it was seen to be very bright; changes in the intensity of these white areas are by no means uncommon, and Libya, for example, was recorded as intensely white by the Rev. T. E. R. Phillips on May 22, 1903.

COLOUR PHOTOGRAPHY OF MARS.—In No. 42 of the *Mitteilungen der Nikolai-Hauptsternwarte zu Pulkowo* M. Tikhoff describes some results he has secured by taking photographs of Mars through coloured screens. These screens transmitted light of wave-lengths 690–655  $\mu$  (red), 680–600  $\mu$  (red and orange), 620–545  $\mu$  (orange and yellow) and 550–495  $\mu$  (green), respectively, and were used in conjunction with the 30-inch equatorial telescope. Taken at the focus, the images of Mars were about 1.5 mm. diameter.

Excellent photographs of Mars were secured, and a comparison of those taken with the red and with the green filters shows some remarkable differences. For example, on the "red" photographs the "continents" (Hellas, Elysium, Ausonia, &c.) are very bright, much brighter than the south polar cap; the latter is the most intense feature on the "green" photographs.

The seas are very dark on the "red" plates and greyish on the "green"; the canals (such as Xanthus, Scamander, Cerberus, &c.) are best seen on the "red" and "orange-red" photographs, their colour apparently resembling that of the seas.

The study of the polar cap led to the conclusion that it was of a greenish colour rather than white, and this suggested ice rather than snow, so experiments on the absorption spectrum of ice were carried out. These, and photographic experiments on sand, snow, and ice made by M. Kalitine, confirmed the conclusion that during August 4–30, 1909, the south polar cap of Mars exhibited the optical properties of ice rather than of snow.

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BROOKS'S COMET, 1911c.—Below we give a further extract from the ephemeris for comet 1911c, published by Dr. Ebell in No. 4528 of the *Astronomische Nachrichten*. The cloudy and hazy skies of the past week have rendered observations difficult, and, apart from these local conditions, the difficulty will now increase owing to the decreasing northerly declination and magnitude.

#### Ephemeris 12h. M.T. Berlin.

1911	$\alpha$ (true) h. m.	$\delta$ (true) °	$\log r$	$\log \Delta$	mag
Oct. 19 ...	12 43.9 ...	+18 15.5 ...	9.7241 ...	9.8498 ...	2.8
" 21 ...	12 39.7 ...	+15 13.1 ...			
" 23 ...	12 36.5 ...	+12 10.4 ...	9.7000 ...	9.8850 ...	2.9
" 25 ...	12 34.4 ...	+9 8.8 ...			
" 27 ...	12 33.3 ...	+6 9.6 ...	9.6904 ...	9.9219 ...	3.0
" 29 ...	12 33.2 ...	+3 14.3 ...			
" 31 ...	12 33.9 ...	+0 24.0 ...	9.6978 ...	9.9587 ...	3.2
Nov. 2 ...	12 35.5 ...	-2 20.0 ...			

This path lies nearly due south through Coma and Virgo, and the comet will be quite near to  $\gamma$  Virginis on November 1.

THE SOLAR ECLIPSE OF APRIL 17, 1912.—From the *Gazette Astronomique* (Nos. 45–46) we learn that preparations are to be made by the Uccle Observatory to organise two stations for the observation of the solar eclipse of April next. According to the *Connaissance des Temps* data, the eclipse should be total for six seconds in Spain, for two seconds in the neighbourhood north of Paris, and should cease to be total in Belgium. But the Nautical Almanac data would make it not a total eclipse anywhere in Europe, although the greatest duration of annular eclipse, six seconds, would then take place in Belgium.

AN ENORMOUS BOLIDE.—On April 10 a great noise was heard at Catania following, by about three minutes, a brilliant flash of bluish-green light; the microseismograph also registered slight movements. These phenomena and their relation to a bolide are discussed very fully by Prof. Ricco in No. 7, vol. xl., of the *Memorie di Astrofisica ed Astronomia*, who finds that the meteor probably exploded at a height of 30 km. above a point some 52 km. N.N.E. of Catania. A careful search in the indicated region has, however, revealed no traces of the fragments as yet. From the tabulated summary of communicated observations it would appear that a most extraordinary phenomenon was very generally observed.

MICROMETER MEASURES OF ENGELHARDT-STUMPE STARS.—During the winter of 1910–11 Dr. Lau employed the 10-inch refractor of the Urania Observatory for micrometer measures of faint stars measured by Engelhardt in the neighbourhood of stars given in Stumpe's catalogue. From these measures and Engelhardt's he has derived the proper motions, which he now publishes in No. 4523 of the *Astronomische Nachrichten*, with notes as to the colour and magnitudes of the pairs; of the fifty-four systems given, about two-thirds are optical, and one-third physical, systems.

PHOTOGRAPHS OF THE 1898 TOTAL SOLAR ECLIPSE.—From the Tokio Observatory we have received a copy of the report of their 1898 eclipse observations, published in 1910. The volume contains some excellent reproductions of photographs of the corona, which were taken at Jeur, in western India, and are described and discussed by Mr. H. Terao and Prof. S. Hirayama.

COOPERATION IN OBSERVING VARIABLE STARS.—The observation of variable stars is one that calls for only a modest equipment, and so can readily be undertaken by amateurs. In No. 166 of the Harvard College Observatory Circulars Prof. Pickering prints a list of 372 variables of long period, and asks for cooperation in the observation of them. Many are already being regularly observed, but more help is required, and, if desired, the results would be incorporated in the Harvard publications.